

In search of optimism

Annual Oration: Royal Victoria Hospital, Belfast, 5th October 2000

A Jennifer Adgey

It gives me great pleasure to welcome the new students to this first academic term in medicine.

As Sir William Osler – a very eminent physician once said – “To study the phenomenon of disease without books is to sail an uncharted sea, while to study books without patients is not to go to sea at all”. There is no substitution for the study of a disease process than the observations made at the bedside of a sick patient. I thoroughly recommend your apprenticeship because without it you will never experience the challenge of diagnosis and treatment balanced with the tragedy for those in whom your help is limited. Despite technological advances, the key to a successful diagnosis still depends mainly on the physician’s judgement based on experience and diagnostic techniques.

Cox in 1999 recognised the limitations of the scientific method in clinical decision-making.¹ The scientific method deals with linear cause and effect sequences, but decisions of both doctor and patient are not linear. The choices and factors have to be matched against numerical comparisons.

A Chinese philosopher once said “Human mind like a parachute, works best when open”. With open minds medicine is a thinking, feeling and doing profession, where science, technology and art converge. A place where physicians are people as well as clinician-scientists; an area where doctors are challenged to think outside the medical model. Welcome to the patient world.

“In search of optimism” I have chosen for this, the 117th, oration.

In 1804 the world’s population was one billion – 100 years later it was two billion. In 2004 it is estimated that it will exceed six billion and by 2025 eight billion. Currently global life expectancy is 66 years and this will continue to increase to probably 73 years in 2025.

GENERAL DISPENSARY

In 1792 the purpose of the General Dispensary which preceded the Royal Victoria Hospital

indicated that the prevention of smallpox and the recovery of persons apparently dead were objects contemplated in the plan. (Prospectus of the general dispensary, Belfast Newsletter, 13 April 1792).² Yet in this city, 172 years later (1964) the first person apparently dead as a result of cardiac arrest (VF) was resuscitated. However as Belfast had a considerable amount of water around it the apparently dead was referring mainly to drowning – “the scheme for the recovery of persons apparently dead from suffocation, drowning and other causes, might also be usefully united with this institution.” (Prospectus of the General Dispensary, Belfast Newsletter, 13 April 1792).³

ROYAL VICTORIA HOSPITAL

In 1896, 12 acres of land were set aside for the erection of the Royal Victoria Hospital and in 1903 the hospital opened at a cost of £300 per bed. The Rt Hon W J and Mrs Pirrie, the Lord and Lady Mayoress of Belfast contributed £100,000 to the building fund; this allowed the hospital to open free of debt. Philanthropy thus operated well in Victorian times. The Belfast Newsletter in 18 September 1903 paid tribute to the work of the old Royal Victoria Hospital on transfer to a new building – “Its path was never an easy one. It was often cramped by lack of funds, accommodation and medical appliances and yet it never wavered from its high ideal. It faced and conquered difficulties which were apparently insuperable and it could boast that no really deserving case was ever turned from its doors. It was not merely a public institution but was bound up inseparably with the history of the city. By the citizens it was regarded as something peculiarly their own, and one and all took a personal pride in its success”. I think we could write the same for today’s hospital. In the Nursing Committee minutes of 1902 we read “If Sisters are thought to be expensive they may be replaced by Staff Nurses

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but capable women are difficult to get in this country and it may be necessary to start the work with Sisters even if advisable to change afterwards". – This is not too dissimilar to what is happening today.

CARDIOLOGISTS

John E MacIlwaine was the first physician in the Royal Victoria Hospital to devote himself especially to the diseases of the heart. (Figure 1) He was first appointed in 1910 and delivered the oration one year later at the age of 37 years.

The electrocardiogram was first applied to human subjects by Professor A D Waller in 1887 and this had been established as a practical clinical method following the invention by Einthoven in 1903 of the string galvanometer. The first ECG machine was purchased for the Royal Victoria Hospital in 1913 and was first used by Dr J E MacIlwaine (Figure 2). It was obviously a very sizeable piece of equipment; both arms of the patient and one leg had to be immersed in saline. The Irish News, November 13th, 1913 announcing the introduction of the electrocardiograph into the Royal Victoria Hospital stated "Electrocardiography is in its



Fig 1. Dr J E MacIlwaine

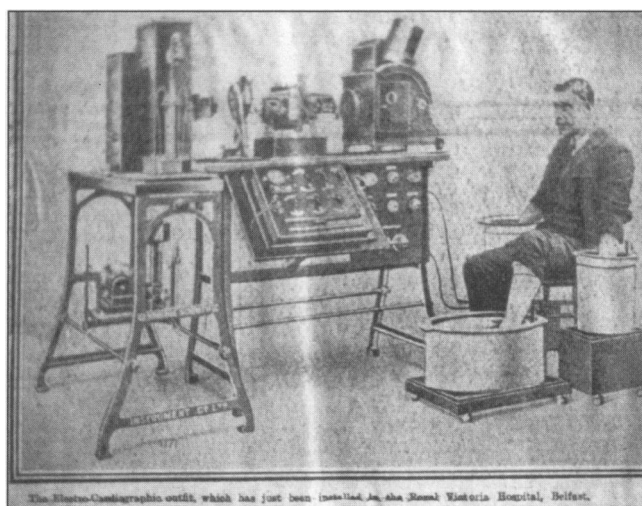


Fig 2. First ECG equipment in the Royal Victoria Hospital, Belfast.

infancy and no mind can foresee what the study of these electro pulsations may evolve". The ECG equipment had been bought by the generosity of Mr James Mackie of the Albert Foundry. The Royal Victoria Hospital was one of the first hospitals in the UK to have an ECG instrument. Indeed Sir Thomas Lewis working at University College Hospital in London, the doyen of ECG development, had only purchased an ECG machine in the preceding year.

Following the introduction of the ECG equipment in 1913, the annual report of the Royal Victoria Hospital stated that "this instrument has already more than justified its purchase and promises to revolutionise the diagnosis and treatment of heart affections".

In 1929 Dr J E MacIlwaine obtained permission to retire from his wards in order to devote himself entirely to cardiology. He was the first clinician to restrict his work to one medical speciality. During the 1914-1918 war, he had taken the hospital ECG apparatus to France for the investigation of cardiac conditions in soldiers. He became one of the original members of the Cardiac Club, now the British Cardiac Society.

Sir Henry H. Dale in 1950 said "I think that our successors, viewing the times in which we live from a long perspective in history, are likely to recognise the first half of the 20th Century as the period in which civilisation began to feel for good or ill the full impact of progress in the natural sciences. The richness of the 19th Century's closing decade in major discoveries of the kind from which science advances with a

fresh impetus and in new directions seems to have caused a sudden acceleration of this process to begin about the turn of the century. In no department of knowledge and practice has this change since 1900 been more conspicuous or more rapidly progressive than in the general field of medicine." (*Advances in Medicinal Therapeutics*, Br Med J, Jan, 1950).

Dr Samuel Boyd Campbell was appointed in 1921 and he took over the ECG Department in 1930 following the tragic death of Dr MacIlwaine. In Figure 3 are seen Dr Campbell and Sr McMath with the very sizeable ECG equipment.

The next appointee to the Royal Victoria Hospital whose major interest was cardiology was Robert Marshall. He was appointed in 1924. His



Fig 3. Dr S B Campbell and Sr McMath and ECG Equipment.

application form for Consultant status is shown in Figure 4. It amounted to 2 pages which is a far cry from the present-day application.

After 1945 saw the break-up of general medicine into many sub-divisions, cardiologists were not classified as a separate group of physicians for many years. Indeed in 1948 there is a letter from Dr Marshall to Dr Sidney Allison, then the Honorary Secretary for Medical Staff, putting forward a proposal for the establishment of a Cardiological Department in the Royal Victoria Hospital.

The next appointees to the Royal Victoria Hospital with a major interest in cardiology were Howard Crozier, appointed initially in 1945, who continued mainly with the ECG Department and Professor Pantridge appointed in 1951. The first mitral valvotomy (1950) was carried out in Ireland by Mr T B Smiley who was then a Surgical

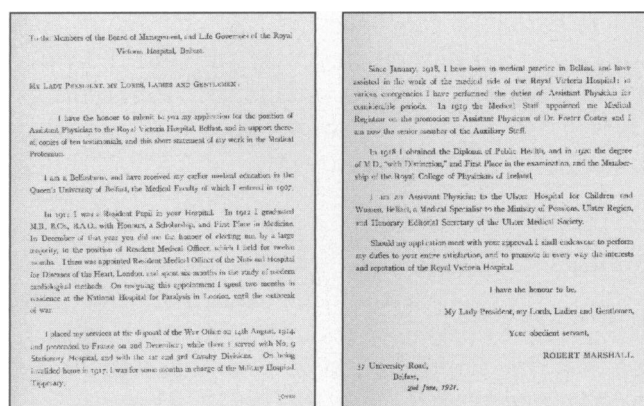


Fig 4. Dr Robert Marshall's Consultant Application.

Registrar, in conjunction with Professor J F Pantridge who at that time was a Medical Registrar – I wonder what the JCHMT would have to say about that today!

In 1950 the first cardiac catheterization was carried out in the Musgrave and Clark Clinic (right heart catheterization) by Professor J F Pantridge; in 1963 he introduced the DC Defibrillator for conversion of atrial fibrillation to sinus rhythm. As shown in Figure 5 it was a very large device which had to be placed on a trolley, otherwise it was not easily mobile. In 1964 the Coronary Care Unit was established in

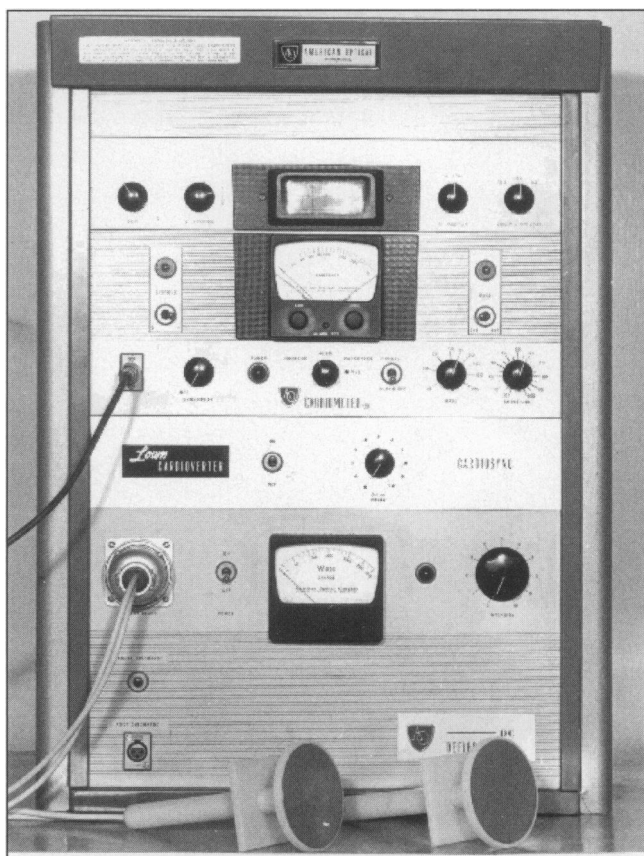


Fig 5. First DC defibrillator.

the hospital by Professor Pantridge and Dr Geddes and in that year the first survival from ventricular fibrillation or cardiac arrest was recorded using DC defibrillation. Shortly afterwards, a cardiac arrest team centred in Wards 5/6 was established to attend those with sudden collapse in the hospital. All necessary equipment and drugs for correction of cardiac arrest were placed on a special trolley for rapid deployment to the patient.

In January 1966 the world's first pre-hospital or mobile coronary care unit was launched from the Royal Victoria Hospital by Professor Pantridge and Dr Geddes. One of the early mobile coronary care units pictured outside the Ambulance Depot is shown in Figure 6.

To complete the team of specialists in Cardiology, Dr Denis Boyle was appointed in 1965; he developed the Mobile Coronary Care concept in the Ulster Hospital, Dundonald. Dr George Patterson was appointed as a Consultant in 1969. His major development was in the cardiac catheterization laboratory. He carried out the first coronary angiogram in the Royal Victoria Hospital in 1970. Dr J S Geddes was appointed in 1971. In conjunction with Professor Pantridge he helped to establish the Coronary Care Unit, the resuscitation service in the hospital, and the Mobile Coronary Care Unit.

When I joined the Unit in 1965 cardiac catheterization was still in its infancy. Coronary arteriography was not undertaken and we were in the early stages of establishing open heart surgery. The plethora of cases in those days which filled the cardiac wards were patients with chronic rheumatic heart disease who needed valve replacement. The Mobile Coronary Care Unit



Fig 6. Dr J S Geddes and Staff with one of the early mobile coronary care units.

had heralded the management of heart attacks outside hospital for the first time. Throughout the past three decades there has been a phenomenal development in techniques for studying heart structure in great detail and hence better overall management of cases.

BASIC, CLINICAL AND POPULATION BASED CARDIOLOGY

Man is a complex machine. Disease is a fault and it is the aim of medicine to repair or prevent it. This is the "mechanical model" of disease. It can at the end of the 20th century still be said to pervade scientific thinking in medicine.

The integration of discoveries between the bench and the bedside, the bridge building between basic, clinical and population based sciences with the developing collaborations with industry and governments have allowed us to take part in many of the world's multi centre trials in order to bring some of the best treatments which otherwise would not have been afforded here but eventually sets the scene for future proof of not only causation but function. To have dared to dream more than others have thought practical and care more than others thought wise, the choices have been many but have also involved travelling a well worn road and doing it better than others thought possible. Thus as we celebrate the new Millennium we are referring to the world as one civilisation.

From the age-adjusted death rates for coronary artery disease in 1996, it can be seen that Northern Ireland has still one of the highest incidences in the world for both sexes. At present in the UK some two million people suffer from angina and there are approximately 300,000 deaths from cardiovascular disease along with 380,000 hospital admissions per year. Thus in NHS costs and loss to the economy in terms of lost productivity, cardiovascular disease, particularly coronary artery disease plays a major role; although the rates for coronary artery disease are falling throughout the western world, they appear to be falling less rapidly in the UK compared to many of our European neighbours.

The Dartmouth Atlas of Cardiovascular Health Care looks at the distribution of cardiologists in the USA which ranges from 2.7 to 11.3 per 100,000 of the population. In Northern Ireland taking all who practise primarily cardiology and those with an interest in cardiology, the ratio is approximately 1.8/100,000 of the population –

this does not reach the lower limit for the United States.

George Bernard Shaw in the preface to his play "The Doctor's Dilemma" wrote that all professions are a conspiracy against the laity. Medicine has become a very significant part of society and we are held to account. Peer review, guidelines, national standards, bureaucracy and budgets have severely restricted our activities made worse by society continuing to expect more with increased accountability and audit. The clamour of discontent – litigation, demands to cut waiting lists etc is many decibels louder than murmuring from patients directly. But unchanging will be their need for perseverance, courage, hope, trust, and the care of a sympathetic physician. In 1903 Sir William Osler stated that "Half of us are blind, few of us feel and we are all deaf". Nevertheless, from the achievements in surgery and cardiology many diseases have been treated effectively or prevented with improved prognosis.

From the estimated US population in 2025, those aged 65 or greater will be 18.3%, with increasing millions suffering heart disease. In the absence of a cure, the patient hopes for a caring doctor. Our working week is taken-up with doing, and thus to find the time to reflect on what we do is difficult but it behoves us to remember that the patient's independence is lost during illness and therefore comfort and care are major factors in our work. Sir Theodore Fox, one of the famous editors of the *Lancet* wrote that "Lack of time made us all bad doctors".

Medicine should not be considered a commodity for the marketplace. Yet the total expenditure on healthcare keeps appearing as a proportion of the GDP. In 1998 at 6.9% we are still lagging behind other European countries (eg France, Germany) Canada, United States and even New Zealand. (8%) I have seen the system for financing and delivering medical care undergo a series of cataclysmic upheavals and re-alignments. I have also seen the painful evolution of the doctor/patient relationship from a largely private affair to one embedded in the "healthcare industry" (a term and concept unheard of in 1979). With all the new managerial roles that a doctor is being asked to cover, I doubt if patients would want to be treated by a health economist than by a practising physician. At times I feel the gridlock of bureaucratic resistance where a great deal of

ingenious effort by a few disappears into the black hole of bureaucracy in which oases of excellence risk being overwhelmed by a desert of indifference and mistrust. I feel at times that we are expected to try an unprecedented triple somersault full twist, quite against the laws of nature. Despite all the clinical governance, peer review and guidelines I think it is important to remember Darwin's inversion which suggests that varieties of excellence, worth and purpose can emerge, bubbling up out of "mindless purposeless forces".

It was David Pyke,⁴ who as ex-registrar of the Royal College of Physicians of London, in reviewing a 100 years of clinical research in Britain described the many routes to significant discoveries "they come from minds prepared and from minds unprepared which by observing what others had seen but not noticed, turned weakness into strength." Good research is about the chase of ideas. Individuals with good clinical ideas are a neglected group.

Although over the past three decades there have been significant improvements in our diagnostic and therapeutic capabilities, we can very rarely cure our patients but are frequently able to improve the quality and length of life.

In this century we hope to see a gradual replacement of palliative treatment by curative therapy, and ultimately a marked reduction and disappearance of cardiovascular diseases. Following the completion of the map of the human genome it will take some time before genetic therapy has a major effect on our therapeutic armamentarium and even longer before we have an animal with our own genetic footprint able to replace our organs when needed.

In the coming two decades we will still have to concentrate on improving our diagnostic techniques along with therapy in order to increase palliation whilst accepting the new information at the cellular and genetic level. Our basic non-invasive tests in order for the diagnosis of cardiac disease – echocardiography, nuclear magnetic resonance imaging, positron emission tomography, electron beam tomography – will undergo further improvement. More catheter-based interventions will be developed. With control of thrombotic and vascular processes in the vessel wall, and the development of new blood vessels (angiogenesis) plus the introduction of new cardiomyocytes into the failing heart we

may succeed in prolonging life. When rejection is controlled and infection prevented cardiac xenotransplantation will become possible. The problem of sudden death outside hospital will lead to the wide application of devices able to detect and correct life threatening arrhythmias.

In the future the major challenge for cardiologists will be to take the knowledge both of basic and clinical aspects of cardiology and apply these clinically. As we discover more and more with regard to function and disease process, brings us to another paradox – the more we know the more we need to learn.

Rabbi Julia Neuberger,⁵ Chancellor of the University of Ulster, once compared the NHS to a theological institution and indicated that the NHS seemed to be becoming less of a church and more of a garage giving consumers (not citizens) whatever care they can get within the limits of medical science. She felt that the NHS of the future will have to adjust to a new relationship with society and equated doctors to priests of the theological institution, and that the quality of care provided must fit those concepts of compassion and fairness written into the original National Health Service of 1948. She felt that individual temples that are unwelcoming must be reformed. Priests who misbehave must be disciplined, new ways of praying – at easy access, walk-in services that complement the continuing relationship with a priest – must be welcomed. The belief is in universal availability – no one wants to wait two weeks to pray!!

As she points out in modern Britain, the faith may appear in new ways – from the evangelical (otherwise known as NHS direct) to the fundamentalist which includes integrated care, holistic approaches and complementary medicine. She believed that faith remains the key to good health. She points out that recognising that the NHS is a creature of faith, an institution in which people have faith, is essential.

One doctor⁶ indicated that “it is all very well congregations are losing their faith but priests have pride too. Many are fed up with trying to provide ever increasing miracles to an avaricious public while their church and “god” do not provide them with the resources. The health service is its staff. Increasingly staff see little reason to continue believing in their church. Many priests and servers might prefer to work in a garage where duties are

clearly understood and adequate resources are available to do the job properly.”

For practitioners the difficulties of keeping up with the sheer volume of the medical literature are immense. George Lundberg⁷ has estimated that 2 million biomedical articles are published every year and that to keep up with all this work a diligent reader has two options – namely to read two articles a day, knowing that within a year he/she will be 60 centuries behind, or to read 6000 articles per day. Eighty to ninety percent of all scientists who have ever lived are alive today;⁷ the medical published record doubles every 12 – 15 years. Thus Index Medicus, published in annual volumes maintained a sylph-like figure of 2 kg per year from its foundation in 1879 until the late 1940s. By the end of the 1970s it weighed an unhealthy 14 kg, despite being softbound and being printed on thinner paper, in a smaller font and with narrower margins. Its electronic counterpart, Medline, currently abstracts nearly 4,000 journals and adds over 400,000 references to its database each year.

Sir William Osler once said “a rare and precious gift is the art of detachment by which a man may so separate himself from a life-long environment as to take a panoramic view of the conditions under which he has lived and moved: it frees him from Plato’s den long enough to see the realities as they are, the shadows as they appear. Could a Physician attain to such an art he would find in the state of his profession a theme calling as well for the exercise of the highest faculties of description and imagination as for the deepest philosophic insight”. A pattern-recognition school of thought sums up our medical training and our everyday practice. William Blake’s Newton (1795)(Tate Gallery, London) thought that the whole of life could be measured by dividers but this is a very simplistic view.

Oliver Wendell Holmes once said “When I want to understand what is happening today or try to decide what will happen tomorrow, I look back.” Within medicine there is an enormous talent and genuine commitment to the NHS. How much better the service could be if the fear of failure and of sticking your head above the parapet were to be swept away and intelligence, truth and humanity allowed to develop. Aldous Huxley said that fear “casts out intelligence, casts out goodness, casts out all thought of truth . . . in the end fear casts out even a man’s humanity”.

And now for the future. The Human Genome Project has provided the scientific community with a map of the entire collection of 100,000 or more human genes and 3 billion letters of DNA encoding these genes. The function of these genes and how they are regulated in health and disease still has to be worked out. Defining diseases by their biochemical mechanisms instead of their pathogenesis is going to alter the way physicians diagnose conditions and prescribe medication.

By the end of this decade predictive genetic screening will probably be coupled to the taking of a history and physical examination. Physicians may be able therefore to move away from what has generally been "one-size-fits-all" prevention efforts and move towards the patients' specific genetic risks. Genetic screening will become less expensive with the emergence of DNA microchip-array technology. This would be "nouvelle medicine" that replaces our halfway technology.

Physicians will be required to understand the kinds of tests available, which test is most applicable, with the interpretation and implementation of the results. They will need to recommend tests to patients, to explain the possible advantages and the limitations of these tests and to interpret the results in lay terms. This kind of information cannot be imparted in the usual 10 minute outpatient visit or a cursory telephone call. Informing patients of a genetic risk will require significant sensitivity and understanding.

Education of the public about genetic screening will undoubtedly take place on the internet and physicians must help to drive this. But with this knowledge goes confidentiality. When you are able to define an individual's genetic make-up and make reliable predictions, this is enormously powerful information.

It is awesome now to contemplate how the next wave of progress in this field will influence all aspects of life in the new millennium.

CONCLUSIONS

The writer E M Forster once said "How do I know what I feel, until I've seen what I've said?". And so I too needed to write these words in order to articulate my feelings. Medicine is one of the few spheres of human activity in which the purposes are unambiguously altruistic – in itself, a remarkable achievement.

History shows goodness follows badness follows goodness. The pessimist turns that around and

concludes the end is nigh. This negative often outsells the positive. But the ace in this circular game is so far still held by the optimists – for all the centuries of naysaying and nighsaying, the sun still rises. There is a crack in everything. That's how the light gets in.

When we look at the young men and women who are thronging about us, we feel that "close on our heels a fresh perfection treads, born of us and fated to excel us". Our faith in the future surges up again and the torch gleams.⁸

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